AS 2896—2011

Australian Standard®

Medical gas systems—Installation and testing of non-flammable medical gas pipeline systems

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The following are represented on Committee HE-017:

- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Society of Anaesthetists
- Australian and New Zealand College of Anaesthetists
- Master Plumbers and Mechanical Contractors Association of New South Wales
- Therapeutic Goods Administration

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee HE-017, Medical Gas Systems, to supersede AS 2896—1998. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

It should be noted that for installation of a pipeline, a high quality of workmanship and experience is essential. For medical gases that are not referenced in Clause 1.2, special pipeline designs may be required, and these are not covered by this Standard. For certain situations, e.g. hyperbaric conditions, special design and performance criteria for pipeline may be required.

Requirements in this Standard may be used as a guide for piping systems for other non-flammable medical gases and anaesthetic gas scavenging systems but variations in the requirements may be necessary.

The Sleeve Indexing System (SIS) for gas specific connections for terminal units previously in the Standard is now covered by AS 2902—2005, including connections for surgical tool gas along with other gases. The new surgical tool gas connection is recommended as it contains a thread, and reduces the risk or 'hose whip'. The use of adaptors with 'quick connect/disconnect' (Schrader) fittings does not comply with this Standard.

In the preparation of this Standard, cognizance was taken of ISO 7396:2007 *Medical gas pipeline systems*—Part 1: *Pipeline systems for compressed medical gases and vacuum*.

The differences between ISO 7396 and this Standard are as follows:

(a) Testing procedures in this edition are more in keeping with Australian industry practice.

(b) Performance criteria vary substantially.

(c) Copper pipe specifications differ.

(d) Medical participation in commissioning is required by AS 2896.

All medical oxygen cylinder valve outlets will be yoke type connections after 2011. Flexible cylinder leads will be replaced as part of this program. See AS 2473.3—2007 for details.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the Appendix to which they apply. A 'normative' Appendix is an integral part of a Standard, whereas an 'informative' Appendix is only for information and guidance.

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FOREWORD

Gas pipeline systems have some characteristic hazards, usually related to their original construction, modification, or repair rather than to problems arising during their working life. Medical gas pipelines are a life support system and as such require careful consideration of their design, construction and installation. Hazards include plumbing errors, use of materials incompatible with the gases to be delivered, obstruction of flow by material left in the pipelines, gas contamination by residual debris or accumulated foreign matter such as scale and organic contamination, and gas contamination due to chemical interaction between the gases and the pipeline components or foreign matter and condensation in pipelines. A particularly hazardous situation can occur when even small amounts of grease or oil come in contact with oxygen and nitrous oxide.

For this reason, this Standard requires that the following procedures be taken to avoid gas pipeline hazards:

(a) Documentation of tests and results from those responsible for the construction are required to be provided to the health care facility, and form a permanent record.

(b) Independent inspection of the system by the health care facility using its own qualified personnel, or an experienced agent, which may be an independent outside contractor, to confirm and document the system's satisfactory operation.

Components of the medical gas system should be obtained and installed under the supervision of a person familiar with proper practices for their construction, installation and use. Construction and installation of central supply systems require great care and should only be undertaken by experienced personnel. In order to establish this, the hospital authority should examine closely the previous experience of any constructor or installer proposing to work on or build a pipeline system. The authority should also determine if the constructor or installer is familiar with the contents of this Standard, which should be specified in the construction agreement.

All companies involved in the design, installation, testing, commissioning, and maintenance of medical gas systems, should have suitable quality management systems.

The maintenance and servicing of the gas pipeline system is the responsibility of the health care facility but may be delegated.

STANDARDS AUSTRALIA

Australian Standard

Medical gas systems—Installation and testing of non-flammable medical gas pipeline systems

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard sets out requirements for the safety aspects, construction, testing and certification, operation and maintenance of non-flammable medical gas pipeline systems used for patient care, therapeutic, diagnostic and for operating surgical tools. Non-flammable medical gas pipeline systems include suction pipeline systems.

The Standard is intended to apply to suction systems for day care centres and clinical situations. It does not apply to suction systems for laboratories or hospital dental units.

The supply of oxygen from pressure swing absorption and similar techniques is not covered in this Standard.

Some requirements are given for the source of supply for each pipeline system as well as those for the pipeline system itself and the terminal units and related warning systems.

The Standard also gives requirements for operating tools, pendants, columns and booms.

NOTES:

1 Patient care encompasses both medical and dental applications.

2 Users of this Standard should be aware that medical gas systems may be subject to regulatory requirements, e.g. from Therapeutic Goods Administration, OHS Regulatory Authorities or Plumbing Industry Commission. Compliance with this Standard may not fulfil all such requirements.

1.2 APPLICATION

This Standard applies to gases and suction services in common use where pipeline reticulation is appropriate and economic. It does not apply to special gas mixtures used in small quantities.

The Standard applies to systems providing the following:

(a) Oxygen.

(b) Nitrous oxide.

(c) Medical air.

(d) Surgical tool gas.

(e) CO_2 (less than or equal to 7%) in oxygen.

(f) Nitrous oxide/oxygen 50/50.

(g) Helium-oxygen mixtures.

(h) Carbon dioxide.

(i) Medical suction.

NOTE: In this Standard, ‘suction’ is the preferred term, and corresponds with the internationally known term ‘vacuum’.

(j) Scavenging.